Strategic Skills Initiative Root Cause Report
Cover Sheet
Economic Growth Region: # 8

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I. EXECUTIVE SUMMARY

Economic Growth Region 8 - Strategic Skills Initiative

Built towards the goal of creating new jobs and raising Hoosier income, the Strategic Skills Initiative (SSI) is a revolutionary effort that fights unemployment by going directly to the root causes. SSI focuses on two primary goals:

- Identify and alleviate shortages projected to exist in critical occupations and specific skill sets within high-wage Indiana industries; and,
- Instill a lasting, demand-driven approach to workforce development at the regional and local level.

This initiative will produce three reports that will be submitted to the Indiana Department of Workforce Development (DWD) over the next few months. These reports will: identify occupation and skill shortages, determine the root causes of the shortages, and develop solutions that are directly tied to the root causes.

The Occupational and Skills Shortages Report was the first of the three reports for Economic Growth Region (EGR) 8. The report focused upon the key industries of manufacturing; health care, professional, scientific and technical services; and hospitality and tourism. Critical occupations and shortages identified by the report included the following:

Occupation	Projected 2 Year Worker Shortage (through 2007)	Projected 7 Year Worker Shortage (through 2012)
First Line Supervisors of Production Workers	18	18
Team Assemblers	234	694
Registered Nurses	191	351
Licensed Practical Nurses	18	148
Nurses Aides	59	94
Respiratory Therapists	26	26
Electrical and Electronics Engineering Techs	134	418

Hospitality occupations encompass a wide range of jobs in the tourism and hospitality sector. Based upon employer input, the report focused upon the skills sets needed by all hospitality workers rather than identifying specific job titles.

This Root Causes Report is the second report produced through the SSI initiative in Economic Growth Region 8 and it identifies the demand and supply side root causes.

Role of the Consortium and Industry Partners

The Region 8 Consortium is comprised of key economic development representatives, employer representatives for key industries, business association members, educational representatives, labor representatives, and others. The Consortium advises the SSI agent and staff in the development of the three reports and plays a key role in determining and prioritizing the solutions for which funding will be requested. An Executive Team is established to meet more frequently to review progress.

Industry partners are also playing a key role in the development of all three reports. Over 50 employers have been willing to support the efforts of the Consortium during the crafting of the first two reports by participating in interviews and providing input and feedback on the identified conclusions. These employers will continue to be valuable primary resources throughout the entire SSI project.

Methodology

As indicated in the Occupational and Skills Shortages Report, workforce development and economic development must work together to grow jobs and personal income for the residents of our region. Since the skills and abilities of the workforce have such an impact upon the ability of local economic development representatives to meet their goals, the SSI Consortium in EGR 8 believes it is important to actively involve these individuals in the project. In support of that goal, a Request for Proposals was released to identify entities interested in providing assistance during the Root Causes and Solutions phases of the SSI project. To insure strong involvement of these entities, eligible bidders were local economic development organizations, chambers of commerce, and other local entities engaged in economic development and workforce development throughout the region. The successful bidder was the Bloomington Economic Development Corporation and their selected subcontractor, Thomas P. Miller and Associates. Also important was the inclusion of economic development representatives from Daviess and Orange Counties in the BEDC project.

Root causes were identified using three different methods. First, as a guideline, interviews with key stakeholders in EGR 8 resulted in a priority list of the top root causes in each industry. Interviews included a list of open-ended questions that were directed at employee recruitment and retention; education and training capacity; career awareness; and wage rates. The interview questionnaire also included a check-off list of potential root causes to obtain a quick-time score intended to assist with prioritizing root causes.

Second, the interview information was compared to data from the Indiana Business Research Center (IBRC), the SSI Toolkit and other government data sources, as well as to experiences described by other state and national studies. Third, from these multiple sources taken together, the top three to four root causes for each industry were selected, and then matched for consistency against the critical occupations identified.

A team of individuals from Corcoran & Wishart, LLC; Vincennes University; Department of Workforce Development local offices; Bloomington Economic Development Corporation; and Thomas P. Miller and Associates participated in the development of this report. By using the SSI Research and Identification Guidebook and the available web-based workshops, every effort was made to utilize the recommended methodology to the fullest extent in reaching the identified root causes contained in this report.

Identified Root Causes

Interestingly, a common set of root causes applies to all four industries. These can be summarized as: Career Awareness, Pipeline Issues, Training Capacity, Leakage/Mobility, and Wages and Benefits. Each root cause plays out a little differently in each industry, but a brief description is as follows:

<u>Career Awareness</u>

The K-12 and labor market information system appear to be lacking in real time, useful information about careers and career pathways. Most significantly, career awareness and counseling in schools appears to be inadequate, but resources available to adults also need improvement.

With the fast-paced economy in which occupations are changing, significantly up-to-date and readily accessible information is going to be important for a prosperous region. A strategy for utilizing this information to increase awareness about the available career paths within these key industries will also be vital.

Efforts must also be made to ensure that students are aware of the skills required to be successful within each industry. Skills such as mathematics, reading comprehension, speaking, writing, and critical thinking are needed in nearly every career path targeted by this report.

Further, increased focus must be placed upon ensuring that current and potential workers understand the importance of job retention skills such as work ethic, positive attitude, and dependability. Many employers who participated in interviews, particularly those from the manufacturing and hospitality sectors, reported difficulty finding workers who have the necessary basic skills and job retention skills to be successful on the job.

Pipelines

As careers become more varied and career pathways more complex, educational providers will have to find better ways for linking educational and training offerings into these pathways. This calls for a very different collaboration among providers and better linkages with area employers.

Capacity

Not surprisingly, in a small metro / rural region it is not possible to provide training capacity in all areas of specialization. But even so, several occupations with large employment identified in this project do not have in-region or near-region resources sufficient to fill training gaps. This applies particularly to the health care field. Efforts must be made to increase the availability and capacity of training programs to better meet the needs of businesses.

Leakage and Mobility

One of the reasons the United States economy is so productive is the flexibility of its labor force. Human capital moves to where it is most in need and is enticed by wages and benefits. Mobility in and out of the region can be expected and should be embraced. If the region has productive and growing companies, it will be attractive to existing or outside workers. The mobility root cause is tied to deep root cause factors, such as quality of life, access to urban amenities, proximity to colleagues with similar interests etc. Some employers are recognizing that the root cause is not only influenced by wages and benefits but quality of work-life, work-life balance, and community quality of life.

Wages and Benefits

Wages and benefits in a free labor market are always a root cause for demand / supply imbalances. In the case of Region 8, like many smaller semi-rural regions, wage rates tend to be below state and national averages so there is an inherent disadvantage to begin with. The issue of wages also relates to the competition among various industries for labor within the region. A number of occupations have skills that are transferable among several industries, which can cause competition among those industries for the same pool of workers. For example, a better paying job for first line supervisors in an industry like construction can lure workers with similar skills away from the manufacturing industry.

Ranking Root Causes by Industry

Local employers were asked to provide input on the priority ranking of the root causes that were identified for the shortages. The table below indicates the priority ranking for root causes within each of the key industries:

Industry	Ranking (1 being most important)
Manufacturing	1. Pipeline Issues / Career Awareness 2. Lack of Training 3. Non-Competitive wages and benefits.
Professional, Scientific and Technical Services	1. Career Awareness 2. Training Options 3. Leakage.
Hospitality	1. Pipeline Issues and Career Awareness / Image 2. Recruitment and Retention 3. Wages and Benefits
Health Care	1. Training Capacity 2. Wages and Benefits 3. Career Awareness, Pipeline Issues and School Preparation.

Root Causes by Occupation

The following tables illustrate the root causes identified in priority order for each of the targeted occupations:

Manufacturing:

INCIDENCE OF MAIN ROOT CAUSES			
Manufacturing Occupations	**Pipeline Issues - - Career Awareness, Public Education**	**Lack of Training Options and Strategies**	**Non-Competitive Wages and Benefits**
Front-line Supervisors/Managers of Production/Operations Workers	X	X	X
Team Assemblers	X		
Big Issues: Occupation's image; educational offerings (high school, post secondary); creative programs; education – industry connections.			

Professional, Scientific and Technical Services:

INCIDENCE OF MAIN ROOT CAUSES			
Professional, Scientific, and Technical Occupations	**Lack of Career Awareness**	**Lack of Training Options**	**Leakage**
Electrical and Electronic Engineering Technicians	X	X	X
Big Issues: Aging of the existing workforce; mobility of young workers with 5 – 7 years experience; interplay with other related occupations (scientists and engineers); quality of life as an attraction / retention factor.			

Hospitality:

INCIDENCE OF MAIN ROOT CAUSES			
	Pipeline Issues	**Recruitment and Retention**	**Wage and Benefits**
Hospitality Workers	X	X	X
Big Issues: Image, turnover; job retention skills; hourly pay not adequate for childcare, transportation, quality affordable housing; pending impact of gaming (will it raise the bar - - higher wages for all or create two tier labor market?); not much traction in schools			

Health Care:

INCIDENCE OF MAIN ROOT CAUSES			
Health Care Occupations	**Career Awareness, Pipeline Opps, School Preparation**	**Training Capacity**	**Wages**
RNs	X	X	X
Licensed Practical Nurses	X	X	X
Nurses Aides	X		X
Respiratory Therapist	X	X	
Big Issues: Much outside local control, e.g. healthcare reimbursement policies / regulations affecting wages, local training capacity (faculty, facilities); job stress / turnover, attractiveness of jobs outside direct care; all regions / states in same boat; quality of work life is important to these professionals.			

Next Steps

Over the next two months, local community leaders and employers will be working to identify possible solutions to the root causes of shortages described in this Root Causes Report. The subsequent Solutions Report will describe the solutions that have been prioritized by the SSI Consortium and will request funds to implement those solutions.

II. INTRODUCTION

Of the 11 Indiana Economic Growth Regions identified by the Indiana Department of Workforce Development, probably none can take fuller advantage of the Department's Strategic Skills Initiative (SSI) than Region 8. Through the SSI, the Department is actively encouraging leaders in Indiana's regions to craft workforce strategies appropriate to changing economies across the state. This comes at a particularly critical and opportune time. Indiana's economy has experienced average performance for many years, obtaining C grades in the Indiana Report Card prepared for the Indiana Chamber of Commerce by Thomas P. Miller and Associates. Given the sluggish economic growth across the Midwest, how can Indiana break away? And, given the fact that the emerging "innovation economy" of the U.S. depends so critically on human capital, how can workforce strategies be more finely tuned to provide competitive advantage to regions?

In addition to the SSI initiative, Region 8 is in the throes of other important development strategy explorations. As a result of recent Base Realignment And Closure (BRAC) deliberations, the Naval Surface Warfare Center, Crane Division, will lose somewhere between 370 and 650 jobs over the next six years. Realignment presents intriguing opportunities for technology company developments and revitalization. Further, issuance of a gaming license in Orange County is raising prospects for heightened recreation, amusement and entertainment industry opportunities in the region. And, as a result of an economic development strategic plan recently adopted by Indiana University, the University is exploring new avenues of engagement with the state and surrounding region. On top of all this, the proposed I-69 extension from Indianapolis to Evansville could serve as an additional growth engine.

This report is the second phase of the Region 8 SSI project. The Occupational and Skills Shortage Report, October, 2005 was prepared by Corcoran & Wishart, LLC. Many occupations in each of the four industries targeted in the first report, (manufacturing; professional, scientific, and technical services; hospitality; and health care) face similar challenges. This analysis seeks to identify root causes of skill shortages that cut across multiple critical occupations while identifying needs and challenges specific to the

targeted critical occupations listed below. It is anticipated that root causes addressed in this report will apply to other occupations in the targeted industries and solutions found in the next phase might improve readiness for sudden, unpredictable changes in the market place or for new occupations that might emerge. This report is focused on the following industries and critical occupations identified in the first report:

Manufacturing:

- First Line Supervisors of Production Workers
- Team Assemblers

Professional, Scientific, and Technical Services:

- Electrical and Electronics Engineering Technicians

Hospitality and Tourism:

- All Hospitality and Tourism Workers

Health Care:

- Registered Nurses
- Licensed Practical Nurses
- Nurses Aides
- Respiratory Therapists

After further research the initial critical occupation Drafting, Mapping, and Engineering Technicians, all others, was eliminated as a shortage occupation.

Methodology Employed

As indicated in the Occupational and Skills Shortages Report, workforce development and economic development must work together to grow jobs and personal income for the residents of our region. Regardless of the occupation, the quality and availability of a skilled workforce has a huge impact upon the economic development efforts of the region. According to a survey conducted in 2004 by the Indiana Business Research Center (IBRC) on behalf of the Bloomington Economic Development Corporation (BEDC), 98.4% of Bloomington employers indicated that quality of the workforce is

either an “essential” or “very important” factor that influences the success of their business. Interviews and discussions with employers throughout the region support these findings.

Since the skills and abilities of the workforce have such an impact upon the ability of local economic development representatives to meet their goals, the SSI Consortium in EGR 8 believes it is important to actively involve these individuals in the project. In support of that goal, a Request for Proposals was released to identify entities interested in providing assistance during the Root Causes and Solutions phases of the SSI project. To insure strong involvement of these entities, eligible bidders were local economic development organizations, chambers of commerce, and other local entities engaged in economic development and workforce development throughout the region. The successful bidder was the Bloomington Economic Development Corporation and their selected subcontractor, Thomas P. Miller and Associates. Also important was the inclusion of representatives from Crane Technology Inc. and economic development representatives from Daviess and Orange Counties in the project.

Root causes were identified using three different methods. First, as a guideline, interviews with key stakeholders in EGR 8 resulted in a priority list of the top root causes in each industry. The interview team included individuals from the Bloomington Life Sciences Partnership, the Daviess County Economic Development Corporation, the Southern Indiana Business Alliance, Orange County Economic Development Partnership, Purdue University Office of Engagement and the Purdue University Travel and Hospitality Research Center. A sample of local firms was selected based upon location within the region as well as having a primary industry classification within one of the four sectors that are the focus of this study. Care was taken to ensure coverage across all counties in EGR 8. Between November 9th through December 2nd, 2005, 48 firms participated in the process. Interviews included a list of open-ended questions that were directed at employee recruitment and retention; education and training capacity; career awareness; and wage rates. The interview questionnaire also included a check-off list of potential root causes to obtain a quick-time score intended to assist with prioritizing root causes. Paraphrased quotes for these interviews are scattered throughout the report.

Second, the interview information was compared to data from the Indiana Business Research Center (IBRC), the SSI Toolkit and other government data sources, as well as to experiences described by other state and national studies. Third, from these multiple sources taken together, the top three to four root causes for each industry were selected, and then matched back against the critical occupations identified for consistency and reported in the order of importance.

A team of individuals from Corcoran & Wishart, LLC; Vincennes University; Department of Workforce Development local offices; Bloomington Economic Development Corporation; and Thomas P. Miller and Associates participated in the development of this report. By using the SSI Research and Identification Guidebook and the available web-based workshops, every effort was made to utilize the recommended methodology to reach the identified root causes contained in this report.

The Region 8 Consortium is comprised of the following key economic development representatives, employer representatives for key industries, business association members, educational representatives and others:

Judy Gray,* Orange County Economic Development Partnership
Ron Arnold,* Daviess County Economic Development Corporation
Steve Bryant,* Bloomington Life Science Partnership
Gary Shelley, Cinergy/PSI
Linda Williamson, Bloomington Economic Development Corp.
Kirk White, Indiana University Community Relations
Bruce Wade, Bloomington Hospital Human Resources Dept.
Carole Maloney, Greater Bloomington Chamber of Commerce
Charles L. Dibble, Greene County Economic Development Corporation
Adele Bowden-Purlee, Bedford Area Chamber of Commerce
Jo Arthur, Southern Indiana Development Commission
Keith Schnulle, French Lick Springs Resort and Casino
Richard Rampley,* Indiana Department of Workforce Development
Bobby G. Minton,* Laborers Local #741
Brenda McLane,* Ivy Tech Community College Workforce & Economic Development
Chuck Martindale, Hoosier Energy
Ron White,* Indiana University Bloomington Continuing Studies
Darrell W. White,* Boston Scientific
Steve Johnson, Paoli, Inc.
Sam Allison, Lawrence County Growth Council
Terri Evans, Manchester Tank
Stacey Cooley, Owen County Chamber of Commerce
Mike Gentile, Crane Technology Inc.
Steve Gault, WorkOne Bedford
Nancy Karazsia, WorkOne Linton
* Executive Team Member

The Consortium advises the SSI agent and staff in the application for funds from DWD and the development of the three reports. An Executive Team is established to meet more frequently to review progress. The Consortium has endorsed this Root Cause Report. Executive Team members representing private employers, economic development, higher education, workforce development, and labor have demonstrated their support by signing the cover sheet of this report.

III. THE ROOT CAUSES

Region 8 was mildly impacted by Indiana's industrial growth of the 20th Century. It has remained a small metro (Bloomington)/rural region, retaining its picturesque Southern Indiana landscape and small town lifestyle. Much of Indiana's industrial and residential development occurred on flatter land to the north. Today, because of improved transportation and communications, workers are choosing where to live and business growth follows. Region 8 with its natural assets, college town amenities and proximity to a large metro area and international airport, is well positioned for quality, sustainable growth in the 21st century. However, one limiting factor is the availability of qualified workers to fit with growing, value-added industries, such as those identified in the Occupational and Skills Shortages Report. Consequently, the root causes of skills shortages and subsequent solutions become central to the region's future.

To date various regional alliances have touched upon opportunities for growth. These include the Crane Regional Economic Development Organization, South Central Indiana Workforce Investment Board, Ivy Tech Regional Board, Southern Indiana Development and Southern Indiana Business Alliance / Crane Technology Inc., and the Bloomington Life Sciences Partnership's Human Capital Committee. Integration of regional strategy including workforce preparation, education, land development, transportation planning, and economic development is beginning to grab leader attention in Indiana. We believe that the SSI initiative will contribute to increased leader partnering and collaborative strategy.

Manufacturing

Indiana's manufacturing industries have undergone considerable restructuring in recent years with job losses in many traditional industries, such as machinery manufacturing. There is, however, some growth in high-tech fields such as nanotechnology, scientific instruments and medical devices. Continued shift toward high-end / advanced manufacturing is expected as routine manufacturing continues to move off-shore. According to the Occupational and Skills Shortages Report, manufacturing accounts for approximately 18,000 jobs in EGR 8. Local input for the report was from 10 employers accounting for approximately 5,000 employees. They range from an international headquartered company, to second and third tier suppliers.

The first report identified the following critical occupations for the manufacturing sector in EGR 8:

1) First-Line Supervisors/Managers of Production and Operating Workers
2) Team Assemblers

According to IBRC data, job openings for both occupations are actually expected to decrease between 2002 and 2012, especially for team assemblers (negative 16 percent). However, since the occupation holds a substantial share of employment in EGR 8 it has been identified as a critical occupation that is expected to show significant shortages due to a lack of new supply of qualified workers in the region.

The 2005 Skills Gap Report by the National Association of Manufacturers (NAM) summarized that the exodus of baby boomers from the U.S. workforce, a negative stereotype of manufacturing, a drop in the number of American students pursuing technical or engineering degrees and the quality of K-12 preparation are fueling the shortage. Ninety percent of respondents indicated a moderate to severe shortage of qualified skilled production employees and 39 percent of respondents also indicated a moderate to severe shortage of qualified unskilled production employees. This result does not vary significantly when controlling for size, industry segment or region. A newspaper article from February 2005 citing the NAM study notes that shortages in manufacturing could become especially acute in Midwestern states and rural areas, where

emigration of young workers puts whole communities at risk.[1] The article also points to the fact that manufacturers fail to embrace new technologies and involve workers in management and product development.

Worker shortages due to retirement seem to be a general problem. Highly related to the assembler and first-line supervisor problem, is difficulty in recruiting engineers. Interviewees noted quality of life as a factor in attracting qualified engineers and highly educated persons to the region. Most of these positions were filled with baby-boomers who are entering the retirement age. Due to this issue, there is an increasing gap in workers to fill these positions. In terms of the critical occupations, aging seems to apply more to the supervisor occupation whose workforce in 2000 already contained 16 percent of workers 55-79 years of age (U.S. Census), i.e. workers that are retiring now. For both first-line supervisors and team assemblers, however, 100 percent of new job openings between 2002 and 2012 are based on replacement needs rather than industry/job growth.

The inability to attract competent workers due to the root causes mentioned below is causing a skill shortage. Another factor, however, mentioned in some interviews is the lack of work ethic of manufacturing workers. In addition to punctuality, work attitude, etc., these workers also do not demonstrate an interest in pursuing training. This might explain why the Indiana ERISS survey found that when compared to other surveyed occupations in the area, turnover of team assemblers is disproportionately high, with at least 90% of occupations in Indiana having fewer turnovers.

Principal Root Causes

The primary root causes of the skill shortages in manufacturing in EGR 8 determined through interviews, industry information, and official data sources fall largely in line with the general trends in manufacturing observed at a national level by the 2005 National Association of Manufacturers survey. The identified principal root causes are:

1) Pipeline issues

"…the upper end (high pay occupation) is not sold on quality of life."

". . .the local culture and rural environment is not often attractive to individuals from large cities - - makes recruiting more difficult."

[1] "Industries Brace for Skilled Labor Shortage." Omaha World-Herald, 2 Feb 2005. http://www.nam.org/s_nam/sec_illumen.asp?CID=201487&DID=233390

2) Training Options & Strategy

3) Wages & Benefits

Other root causes identified by several interviewees were: aging workforce, out-migration, quality of life, work ethic, and getting to a critical mass of like industries to make the area attractive to specialized workers.

Root Cause 1 Pipeline Issues

Most applicable to: First-Line Supervisor of Production and Team Assemblers

Career Awareness & Advancement

Most respondents in the region pointed to the K-12 system as not providing sufficient information about possible careers in manufacturing and steering qualified candidates to other fields. Some employers pointed out the need to develop better vocational/technical education programs and partnerships with schools. Current partnerships with the Ivy Tech system and higher education, although more advanced than that with secondary schools, is not as strong as it can be in matching qualified candidates with jobs in the field.

> *"Particularly for our production staff, a clearly defined work path / career is not common . . .many lack a career perspective and a grasp of how manufacturing can be a long-term opportunity."*

In addition to gaining an increased awareness about available career opportunities, students also need more information about the required skills sets and expectations of employers in the manufacturing industry. According to a number of interviewees, ONET skills such as critical thinking, speaking, writing, reading comprehension, and mathematics are important in the manufacturing industry, particularly for supervisors. These skills are the foundation upon which successful movement up the manufacturing career ladder is based. Public schools, guidance counselors, and workforce development professionals need to make a conscious effort to ensure that students who express an interest in manufacturing careers are aware of the full set of skills and abilities that are required.

Further, schools and workforce development professionals also need to emphasize the importance of work ethic, positive attitude, dependability and other job retention skills. Of the employers who participated in interviews, 80% mentioned lack of basic skills

and/or work ethic and job readiness issues as deficiencies that need to be addressed in their current and potential workforce.

Also, linked with career awareness, is the need for stronger vocational/technical programs at the secondary level to prepare students for entry into manufacturing. In a similar manner, awareness of the extensive career paths available in manufacturing has to be promoted.

Public Education

Interviewees also noted that there seems to be inadequate coordination and communications between secondary schools and the manufacturing community in EGR 8. Respondents indicate that the school systems are not focused on providing much education for students who may be going into manufacturing careers. This is not only an awareness problem, but also a problem with training options. Most training is left to the higher education system, which is not geared towards entry level manufacturing positions.

Sensitivity

The awareness of careers and career paths in manufacturing and the lack of basic skills of new employees are widely cited phenomenon in manufacturing, applying to some extent, to every occupation in the sector. Not only improving the productivity of workers through training, but the productivity of training programs will be important for the future. In addition, widespread efforts to promote occupations in manufacturing, such as first-line supervisor or the lower skill team assembler, have to overcome the negative image of manufacturing, and if successful, could also improve the availability of educational programs that are more responsive to industry needs (see below).

> *"…there is a constant shortage of skilled labor. . .training time and turnover is excessive."*

Root Cause 2 Lack of Training Options and Strategies

Most applicable to: First-Line Supervisor of Production

Although there is a better relationship between the manufacturing sector and the higher education system, respondents in the interviews noted that the focus is not on entry-level positions which are in demand, but rather on advanced positions. In general, a lack of

training options and training strategies was pointed out as a primary root cause for skill shortages in the EGR 8 manufacturing sector.

For first-line supervisors of production, Indiana University is offering a bachelor's of science in business with a major in production/operations management. Ivy Tech and Vincennes University are offering associate's degrees in organizational leadership but not with a specific focus on production work. There are over 20 programs in the remainder of the state, with about half of them providing associate's degrees and half providing bachelor's degrees, again mainly for organizational leadership with little industrial production emphasis. The lack of training options noted by interviewees, therefore, seems to be more about specific skills needed that are not covered in these general training programs.

> *"In general, a lack of adequate manufacturing education partnerships with secondary schools, technical schools, colleges and universities in the state of Indiana."*

Since there are no training requirements for team assemblers, except a high school diploma, educational issues will fall back more to the public schools as described in Root Cause # 1.

Sensitivity

The current training options in EGR 8 and Indiana are not specific to the needs of the critical occupations in manufacturing in this report. To the extent that students therefore pursue careers outside of manufacturing, such as in construction, there might be an opportunity, or rather necessity, to work with the higher education institutions in the region to provide additional specialty programs that cater to the local businesses. This is generally better done for construction and consequently, skilled workers are often more attracted to that industry.

Root Cause 3 Non-Competitive Wages & Benefits

Most applicable to: First-Line Supervisor of Production

Respondents mentioned that many lower wage workers are willing to leap to a different job, or leave the area for a higher wage, even when staying the "career path" in the local company might benefit them in the long-term.

A comparison of hourly average wages in 2003 by occupation indicate that team assemblers at $13.8 per hour receive close to the Indiana average which is higher than the U.S. average, and that first-line supervisors are slightly below both the state's and national average with $21.4 per hour.

Average Hourly Wages, 2003

Occupation	Region 8	Indiana	Indiana = 100	Midwest* = 100	U.S. = 100
First-Line Supervisors/Managers of Production and Operating Workers(511011)	$21.42	$22.47	95	92	95
Team Assemblers(512092)	$13.84	$13.98	99	102	113

*Note: * Average of Ohio, Illinois, Michigan and Kentucky*
Source: IBRC; BLS, OES, November, 2003

Benefits are harder to assess quantitatively. Without considering the specific industry, EGR 8 seems to have the same average supplements to wages and salaries as the Indiana average (Bureau of Economic Analysis, Regional Accounts). However, benefits in the manufacturing sector tend to be higher than other occupations, with on average 33 percent of compensation representing benefits compared to a 28 percent average for all occupations (BLS, National Compensation Survey). The difference could, of course, still lie with the individual companies in the region.

Sensitivity

Especially for the first-line supervisors, inter-industry wage differences are a higher attraction point than inter-regional wage differences. Construction first-line supervisors as well as first-line supervisors of mechanics, installers, and repairers who have completed the same type of training program as the supervisor of plant production will earn 8 to 15 percent higher hourly wages in EGR 8 (IBRC, 2003 data). Again, the marketing of specific manufacturing careers and future career opportunities is crucial. Team assemblers, for example, can eventually become first-line supervisors. Their shortage aggravates the future shortages of supervisors in the region. This clearly is a career pathway with opportunities that should be well promoted for those on a non-college bound career path in the region.

Conclusion

INCIDENCE OF MAIN ROOT CAUSES			
Manufacturing Occupations	**Pipeline Issues - - Career Awareness, Public Education**	**Lack of Training Options and Strategies**	**Non-Competitive Wages and Benefits**
Front-line Supervisors/Managers of Production/Operations Workers	X	X	X
Team Assemblers	X		
Big Issues: Occupation's image; educational offerings (high school, post secondary); creative programs; education – industry connections.			

1. **How does the demand side contribute (Compensation levels, work environment, etc.)?**

   Compensation for supervisors appears to be a factor and is becoming increasingly important as the region grows with new investment and as the construction industry lures workers away from manufacturing.

2. **How does the supply side contribute (training capacity, responsiveness of training offerings, and coherence of "supply chain" of workers)?**

   Poor career pathway development is evident and frustration with a lack of secondary schools to work towards continuous learning for the non-college bound is very evident.

3. **How do demographic / geographic factors contribute (sustained workforce size, age distribution, mobility)?**

   Today production jobs are closely related to engineering and design jobs in growth companies. The mobility issue relates more to engineers. Moreover, without engineers, manufacturing facilities lack innovative and productivity improvement.

4. **How much do each of these factors contribute (identify contribution of each factor to shortages)?**

   The survey results show on order of importance (1 being most important):

   1. Pipeline Issues / Career Awareness
   2. Lack of Training
   3. Non-Competitive wages and benefits.

   Respondents to the root causes interviews did cite team assemblers as a key critical occupation and explained the situation mainly through Root Cause #1, the issue of career awareness. First-line supervisor occupations are primarily plagued with training options that are not specific enough to the industries' demand but their predicted shortage is relatively small. Root causes 1 and 2 are highly related for both occupations. The focus should therefore be on extensive collaboration with the public and higher education system to address the industry's concerns with team assemblers. Efforts also must be made to increase job retention skills and decrease turnover of team assemblers.

Professional, Scientific & Technical Services

Professional, Scientific, and Technical Services in EGR 8 have seen strong growth in the region over the last 10 years both in terms of companies and in terms of jobs. Twelve employers, hiring approximately 5,000 employees, were interviewed. The Occupational and Skills Shortage Report for EGR 8 identified the following occupation as critical to this industry and region:

1) Electrical and Electronic Engineering Technicians

The projected growth of job openings between 2002 and 2012 is close to 10 percent for the Electrical and Electronic Engineering Technicians (BLS, OES). Although Drafting, Mapping, Engineering Technicians, All Other, was originally on the critical occupation list, research conducted during the production of the first report came to the conclusion that there are no anticipated shortages in this occupation in the EGR 8.

Several other critical occupations were identified by individual interviewees that are tightly related to the technician shortage such as: mechanical, electronic, optical engineers, programmers, logisticians/supply chain managers. The whole engineering "production chain" appears to be facing workforce gaps. Since several employers are defense related, there is a special need for engineers and technicians with security clearances. Although electrical and electronic engineering technicians have been specifically targeted by the SSI project, it is anticipated that other jobs within the engineering profession will also benefit from the solutions that are identified to address the technician shortages.

Principal Root Causes

The main root causes determined through interviews, industry information, and official data sources in professional, scientific and technical services are:

1) Lack of Training / Education Options
2) Pipeline Issues
3) Leakage

ROOT CAUSE 1 LACK OF TRAINING OPTIONS

Some of the respondents that indicated training options were a problem desired outside training providers to design programs specifically to their needs. According to the Indiana ERISS survey, the preferred education level in Indiana for electrical and electronic engineering technicians is actually a bachelor's degree. Another respondent indicated a lack of certification training programs for advanced IT occupations within the region.

> *". . .Lack of understanding by secondary and technical schools that jobs still exist in the repair field that can provide a good income with the proper technical degree or certification.".*

There are approximately 35 education programs available for electrical and electronic engineering technicians in the state of Indiana with only seven providing a bachelor's degree. For the universities that supplied estimates of training capacity, it seems that there is still room for enrollment expansion. Ivy Tech Bloomington and Vincennes University reported combined completion rates of only 50 percent and only 60 percent of program completers work in EGR 8, primarily being employed by Crane.

Sensitivity

Regional providers would need to work on completion rates to increase the turnout of programs. The overall problem seems to be partly one of access to advanced degrees, which may put it outside the sphere of the DWD initiatives. The lack of access to programs close by is also an issue, although efforts to improve access to training are currently underway through the development of the Westgate at Crane Technology Park. Higher completion and placement rates in the region would of course also help the regional skill shortage. In their work life, scientific and technical workers tend to align with professions and continuing education as well as with the work place. Consequently proximity to ongoing intellectual stimulation appears to be a disadvantage in the region. No interviewees mentioned active professional / scientific networks in the region, especially for the technician level.

ROOT CAUSE 2 PIPELINE ISSUES

Lack of Career Awareness

One respondent indicated that there is a lack of instructors willing to devote time to electronics training as they too feel that there is no market for that type of training. Some respondents feel that both a lack of strong recruitment within the industry, and a lack of outreach to convince potential workers that there are existing job opportunities, are contributing to the shortage. Several noted that the sputnik scare and the return of Vietnam Veterans elevated the supply of middle level and senior technicians and technologists. Today little news or national priority piques interest for students to enter in those fields.

> *"Short term, it is a PR problem, long term it is about getting numbers of locals into a field" (critical mass).*

Efforts should also be made to ensure that students understand the skills that are needed to be successful in these technical jobs. Employers indicate that in addition to the required technical skills, workers in this industry must also have reading comprehension, complex problem solving, judgment/decision making, and trouble shooting skills.

Aging of the Technical Workforce

Several interviewees noted that the strong supply of technical and scientific workers in the 60's and 70's is leading to a mature and highly productive workforce today. However, the same healthy supply does not exist for the future. A downturn in the supply of scientists, engineers and technicians has been recognized by a number of national reports / studies in the past two years. The U.S. faces a near "perfect storm" with respect to this labor supply which appears also to be reflected in the region as described by the concerns listed below:

- Many middle level and senior staff getting near retirement.
- Fewer young people entering these fields.
- Less emphasis on science, math and pre-engineering / pre-technology in the schools, little attention to electronics in school curricula.
- Lower percentages of minorities entering the field.
- Global growth in these occupations, particularly in Asia.

ROOT CAUSE 3 LEAKAGE

There is a perception amongst respondents that although the engineering schools within the state are producing a large amount of graduates at both associate's and bachelor's levels, local firms are not capturing their fair share to the region. And, more experienced engineers and technicians, are not willing to come back to the region. The aging workforce is further contributing to the shortage problem. The inability to attract and retain new talent combined with the retirement of older skilled workers is creating a large skills gap in the critical occupation. The critical occupation does have significant replacement needs estimated up to 2012, as 65 percent of future job openings are based on replacement needs rather than new job growth (IBRC).

Migration patterns by occupation for EGR 8, or for counties in general, are hard to estimate, and in this case are not recommended as the sample from the U.S. Census public-use microdata files would be too small to be reliable for an occupational analysis. At the state level between 1995 and 2000, Indiana did experience a small influx of engineering technicians though the margin was fairly small (2 percent in-migration). This could have changed over the last 5 years, especially at a regional level. For example, according to the respondents there is leakage of workers from Crane out of the region. For the region in general, there was an outflow to other states of 599 residents, (which includes both workers and non-workers) between 2003 and 2004 (IBRC), but in addition there was also positive international inflow of 677 individuals, which most likely reflects foreign students to Indiana University. However, since the characteristics such as age or work status of these individuals are not known, it is hard to judge whether they are contributing to the long run supply of the technical workforce.

> *"Once they have experience (5 – 7 years), they leave and will not return".*
>
> *"The region is not thought of as a high tech area".*

Most respondent comments indicated that there is a strong link between competitive wages and quality of life in the attraction and retention of this workforce. Evidence shows that the average hourly wage for electrical and electronic engineering technicians at $25 per hour in EGR 8 is actually above the Indiana and U.S. average, although the average annual wages for all professional, scientific and technical services in EGR 8 are substantially below the U.S. average, with a difference of $38,440 in EGR 8 versus an average of $62,525 in the entire country.

Migration, as affected by wages, might be more applicable to other occupations in the industry, especially as many respondents pointed to the sometimes more acute shortages of higher skilled workers. An additional related occupation that has been mentioned by several respondents as being in a shortage situation is computer programmers, which have a substantially lower hourly wage in EGR 8 compared to the rest of the state (almost 16 percent lower) or the U.S. (close to 30 percent lower). However, the occupation holds a relatively low employment share and is expected to grow at less than 3 percent in the region. The occupation in addition requires on average an advanced degree. These factors together do not make it an appropriate target for the DWD initiative. As an attraction factor, wages might therefore be more of an issue for other related occupations in the industry; however, this negatively affects career pathways and growth prospects for technicians.

There is also some issue with finding work for spouses of technicians who might be willing to work within the region. Also, due to the well-publicized decline of some firms within the area, some workers are not willing to join the workforce due to uncertainty in the future of these firms. Despite these primary root causes, overall PS&T industry growth over the last 10 years in the region has been very strong - - a 36 percent growth in establishments and a 61 percent increase in jobs. This further illustrates how important it is for community leaders to find an answer to skill gap constraints.

Sensitivity

The data suggests that the cause of leakages from EGR 8 to other regions in Indiana or other states is not clearly explained by wage differentials. Nor is there clear evidence that substantial migration is occurring for electrical and electronic technicians, except for results from the regional interviewees that often did not clearly refer to a specific occupation when discussing migration issues. To the extent that migration is currently occurring or will occur in the future for the critical occupation, more environmental factors such as quality of life and perception of the industry have to be addressed rather than simply raising wages.

"It is hard to recruit to Indiana. It has an image problem" and "spousal preference is a factor".

Conclusion

INCIDENCE OF MAIN ROOT CAUSES			
Professional, Scientific, and Technical Occupations	**Lack of Career Awareness**	**Lack of Training Options**	**Leakage**
Electrical and Electronic Engineering Technicians	X	X	X
Big Issues: Aging of the existing workforce; mobility of young workers with 5 – 7 years experience; interplay with other related occupations (scientists and engineers); quality of life as an attraction / retention factor.			

1. **How does the demand side contribute (Compensation levels, work environment, etc.)?**

   Compensation specific to electrical and electronic engineering technicians does not appear to be a problem. However, lower compensation in related occupations should be of concern. Quality of life and a stimulating network of like workers (critical mass) does dampen demand.

2. **How does the supply side contribute (training capacity, responsiveness of training offerings, and coherence of "supply chain" of workers)?**

   The local training for these technicians is inadequate, but hard to achieve given high costs and relatively low potential enrollments. The issue is one less of training in the region as making sure those who leave the region return after their education.

3. **How do demographic / geographic factors contribute (sustained workforce size, age distribution, mobility)?**

   The most important and looming factor is baby boomer aging in this occupation and related occupations.

4. **How much do each of these factors contribute (identify contribution of each factor to shortages)?**

Ranked in order (1 is highest)

1. Career Awareness
2. Training Options
3. Leakage

The root cause of the predicted shortage in electrical and electronic engineering technicians is not as clear cut as for the other critical occupations in this report. It seems to be much more combination of many different factors. Further, because this industry is quite diverse and growing in Region 8, and because other related occupations are also quite critical, a more multi-occupational strategy may be appropriate when identifying solutions.

The Hospitality Industry

The 15,000 worker strong hospitality industry in EGR 8 is expected to face shortages in the near future as growth is accelerated by the construction and expansion of the French Lick Springs Resort and Casino and renovation of the West Baden Springs Resort.

"Acute need to hire out-of-county will be necessary to cover job / positions in hotels / casino in late 2006 / early 2007".

Because of this dramatic change in the industry and regional diversity of the traditional hospitality industry, the Occupational and Skills Shortages Report for EGR 8 identified critical skills rather than specific occupations. Attempts were made during the employer interviews to identify specific critical occupations within the industry. Management occupations were cited by many interviewees as a shortage in the industry, but most acknowledged far less turnover of management positions than with front line staff positions.

In combination with regional data, one management occupation with high replacement needs is indeed standing out, first-line supervisors of food preparation and serving workers. In addition, since gaming jobs have not previously existed within EGR 8, it is obvious that experienced workers do not currently exist within the region and will need to be identified for these jobs. Both gaming supervisors ($19.90/hr.) and gaming cage workers ($10.60/hr.) pay wages that are above average for the region. Occupations that were most frequently cited in the interviews were: servers, cooks, sales person / clerks, housekeepers, and sales managers, most of which are relatively low paying jobs and as such do not meet the criteria of SSI.

"*The focus is on skills rather than occupations….this builds a better team because employees understand the big picture…"*

The interviews, however, did reaffirm the region's approach of addressing skills sets that are critical to the hospitality industry as described in the Occupational and Skills Shortage report. A number of the employers who participated in the interviews indicated that cross cutting skills are more important for most hospitality occupations than specific job skills. Employers report that often workers who have moved to various positions within different parts of the industry while working their way up the career ladder are more effective employees because they understand the important contribution that all

employees, from groundskeepers to front desk personnel to food service workers, make to customer satisfaction.

As indicated in the Occupational and Skills Shortages Report, the real challenge for this industry is to find individuals with a passion for serving people who also have the basic and social skills necessary to be successful in this industry. Those workers who possess the skills and desire to be successful in this industry can access a number of supervisory and management career opportunities which typically pay well above the average wage for the region.

Principal Root Causes

Seventeen employers covering all facets of hospitality and eight counties were included in the interviews. The primary root causes determined through these interviews, industry information, and official data sources on the hospitality sector are:

1) Pipeline Issues
2) Wages & Benefits
3) Recruitment and Retention

Throughout all interviews basic skills were an issue. Just as for the other critical occupations, ISTEP results for EGR 8 indicate that results vary substantially within the region. Employers might therefore face a very differentiated high school graduate cohort.

Root Cause 1 Pipeline Issues

Career Awareness seems to be a prevalent root cause with most respondents. The nebulous image of careers within the hospitality industry may be contributing to a lack of understanding of the industry and ability of individuals to get interested in possible careers. It may also make it difficult for guidance counselors and workforce experts, used to a more traditional workforce system of defined occupations and skill sets, to assess and identify those individuals that are fit and qualified for careers in the hospitality industry. Most respondents feel that more must be done within the secondary school system to get people acquainted with these careers, although it would be interesting to find out from students whether early perception or realism of low-wages may have already shaped career awareness. The interviews did not make any note of this root cause applying to any particular occupation,

> *"The local tourism businesses focus on transferable skills, as they cross-train and move employees around in different positions".*

but rather being a widespread phenomenon. Rather than focusing upon a specific occupation, many employers are using cross-training to adapt to skills challenges.

In addition to gaining an increased awareness about available career opportunities, students also need more information about the required skills sets and expectation of employers in the hospitality industry. According to a number of interviewees, ONET skills such as active listening, critical thinking, time management, service orientation, social perception, speaking, writing, reading comprehension, and mathematics are important in the hospitality industry, particularly for supervisors. These skills are the foundation upon which successful movement up the hospitality career ladder is based. Public schools, guidance counselors, and workforce development professionals need to make a conscious effort to ensure that students who express an interest in hospitality careers are aware of the full set of skills and abilities that are required.

Further, schools and workforce development professionals also need to emphasize the importance of work ethic, positive attitude, dependability and other job retention skills. Nearly every employer that participated in an interview offered comments about the importance of basic skills as well as job retention skills. Most express difficulty finding employees who have both the basic skills and the "soft skills" (i.e., work ethic, good attitude, ability to communicate effectively, good attendance and punctuality, dependability, etc.) needed to be successful in these jobs where customer service is key to the success of the industry.

Root Cause 2 Wages & Benefits

Respondents did indicate that they have difficulties with work ethic, job hopping and motivation of employees. According to the 2005 Indiana ERISS survey, waiting, food preparation and receptionist/information clerk occupations all have a very high turnover rate in the state as they are often seen as entry jobs to other occupations. Most of these "root causes" may be more symptomatic of a larger root cause, which is non-competitive wages. The average annual regional wages in the hospitality industry (defined as NAICS 71 and 72) are below the Indiana and U.S. average, especially for the arts, entertainment and recreation industry (more than 40 percent lower than the state average). Mostly for the food preparation occupations and particularly for the supervisor occupation, hourly wages in EGR 8 in 2003 were below the Indiana average, and even more below the

national level. Wait staff, on the other hand, can expect wages at the state average. Wage differences definitely seem to be an issue for the food and accommodation and entertainment industries in the region though different occupations have very different experiences.

Average Annual Industry Wages, 2004							
					Avg. Annual Growth 1994-2004		
Industry (NAICS)	Region 8	Indiana	Indiana = 100	US = 100	Region 8	Indiana	U.S.
Arts, Entertainment, and Recreation (71)	$14,988	$25,817	58	55	5.7%	6.3%	5.0%
Accommodation and Food Services (72)	$10,488	$11,578	91	71	4.3%	4.0%	4.3%

Source: IBRC; BLS, QCEW

Sensitivity

Wages in the hospitality industry in general would need an enormous boost to compete with other states and other industries. The problem is region and industry-wide. Most likely the resort and casino development in Orange County will change this wage structure for the wider industry. Consequently, a more regional approach to growth strategies is apparent and called for by many interviewees.

Root Cause 3 Recruitment and Retention

Housing, Childcare and Transportation

As the hospitality industry often pulls primarily from low income workers, issues such as affordable housing, childcare and transportation are more prevalent in the workforce. These societal barriers to work must be addressed not only to increase the pool of available job candidates, but to combat poverty. Most respondents indicated that these issues increase tardiness and absenteeism within the workforce.

> *"Wages / benefits affect this greatly because low wage can't afford to pay for child care".*

Conclusion

INCIDENCE OF MAIN ROOT CAUSES			
	Pipeline Issues	**Recruitment and Retention**	**Wage and Benefits**
Hospitality Workers	X	X	X
Big Issues: Image, turnover; job retention skills; hourly pay not adequate for childcare, transportation, quality affordable housing; pending impact of gaming (will it raise the bar - - higher wages for all or create two tier labor market?); not much traction in schools			

1. **How does the demand side contribute (Compensation levels, work environment, etc.)?**

   Demand for these occupations is strong and growing. Non-competitive wages in many hospitality jobs are a problem. At the same time, employers make the work environment appealing through team work and multi-tasking, this also increases productivity.

2. **How does the supply side contribute (training capacity, responsiveness of training offerings, and coherence of "supply chain" of workers)?**

   An image of the "low pay" and casual jobs affects supply. The recreation and hospitality industry is not viewed as a mainstay industry and as such attracts fewer candidates.

3. **How do demographic / geographic factors contribute (sustained workforce size, age distribution, mobility)?**

   Shear minimal shortages of workers can be expected as gaming comes online late 2006. Workers appear to be quite mobile and the industry does appeal to an increasing numbers of immigrants.

4. **How much do each of these factors contribute (identify contribution of each factor to shortages)?**

   Ranked in order (1 is highest rank)

   1. Pipeline Issues and Career Awareness / Image
   2. Recruitment and Retention
   3. Wages and Benefits

The root causes pointed out by respondents in EGR 8 were more qualitative and hence difficult to verify for specific occupations. There seems to be a general lack of career awareness and challenges with retention. First-line supervisors/managers of food preparation and serving workers stands out as the only occupation with a clear distinction with respect to non-competitive wages contributing to shortages but this occupation is not expected to grow as significantly as other occupations and therefore might not face a very substantial shortage.

Health Care

Indiana has a high employment concentration for health care industries and EGR 8 is no exception. As indicated in the first report, the health care industries contribute approximately 13,000 jobs to the region. Jobs in EGR 8, especially in ambulatory health care services and hospitals, have grown, on average, three percent per year in the last 10 years (Bureau of Labor Statistics, Census of Employment and Wages).

The hospital sector has shown the most growth in establishments and jobs within the health care sector in EGR 8. With an increasing focus on life sciences in Bloomington through the Bloomington Life Sciences Partnership activities, and as the new Certified Technology Park takes off in 2006, these industries and associated occupations can expect to grow even more. Additionally, there are new opportunities expected in healthcare positions at the Midwest Proton Radiotherapy Institute and 250 new positions are expected to be added at the new Monroe Regional Hospital. This will further diversify the healthcare landscape, yet add to the need for more skilled positions.

Information obtained in this report was from a cross-section of this growing industry, covering large hospitals, clinics, long term care, home health, and life science companies. Eight in-depth interviews of employers representing approximately 2,500 workers were conducted.

The Occupational and Skill Shortages Report for EGR 8 identified the following critical occupations for the health care sector:

1) Registered Nurses
2) Licensed Practical Nurses
3) Nurses Aides
4) Respiratory Therapists

All of these shortage occupations have been identified in similar studies of the health care industry across the United States. Most is known about the nursing shortage (both Registered Nurses and Licensed Practical Nurses), while less is known about shortages in nurses aides and the unique challenges facing the allied health professions, such as

respiratory therapy, radiation technology, and physical therapy. Indiana University's School of Nursing has successfully increased undergraduate enrollment by focusing on nursing as the gateway to a lifetime of career opportunities.

Nursing occupations have been facing workforce problems nationally for decades. Registered nurses, in particular, are expected to grow 3.7 percent annually based on 2002 to 2012 projections by the Bureau of Labor Statistics. Respiratory therapists are an even faster growing occupation with expected annual increases of 5.5 percent over the same period.

Principal Root Causes

The following root causes were identified for EGR 8 as being responsible for a large part of the skills shortages in most of the critical occupations in health care, including those targeted by this report:

1. Training Capacity
2. Wages
3. Career Awareness, Pipeline Opportunities and School Preparation.

All of the causes listed above are frequently mentioned in national studies. However, training gets a higher profile in this study than in most. Other root causes include nursing job stress, organizational culture and work schedule, high entry requirements that put off promising candidates, limited career advancement, nurses finding jobs outside healthcare, and out migration.

Many of the healthcare professions face similar growth challenges. This section therefore, focuses on broader occupational (nursing and therapy in general) root causes of skill shortages, rather than trying to dissect each individual occupation. This also assures that any policies based on this root cause analysis will address related occupations in this industry, including those that might well turn critical if sudden, unpredictable changes in the market occur, or if new occupations emerge.

Other State and National Studies

Literature on shortages and root causes in health care tend to focus on registered nurses and respiratory therapists (which is informative in its own). According to national data from the American Association of Colleges of Nursing (2003), the most frequent causes for nursing shortages (mostly focused on registered nurses) on the supply side were: 1) slowing enrollment, often due to capacity problems that result from faculty shortages, and 2) an aging nursing workforce with high replacement needs due to retirement.[2] State reports confirm that faculty shortages are a main cause of nursing shortages.[3] Retention problems due to job burnout and dissatisfaction and the changing work climate as well as the poor image of nursing were cited as well.[4] Some state reports also highlight retention problems[5] as well as the migration of their nursing workforce.[6]

According to a 2002 national American Federation of Teachers (AFT) Survey of respiratory therapists, radiology technologists, and certified nursing aides, all three occupations were experiencing severe staffing crisis.[7] Respiratory therapists perceive a relatively acute recruitment challenge (66 percent of AFT survey respondents). North Carolina, for example, reports that lagging supply is due to insufficient programs, high attrition rates and faculty shortages.[8] The situation is reversed for CNAs, where high turnover is a problem. All three groups express low levels of satisfaction and report poor morale among their professional peers. Salaries or benefits were another area of discontent.

Many other root causes have been mentioned that were only partially supported by regional data or existing studies and therefore did not receive priority. These included an aging workforce and out-migration. The former seems to be currently slightly less of a problem relative to national trends although it is an issue for all occupations. In EGR 8 the projected number of total openings that are due to replacement needs for the critical healthcare occupations tend to be below 50 percent whereas many other occupations are projected to have all their job openings occur from replacement. Out-migration

[2] See also the Annual Survey by the American Association of Colleges of Nursing (AACN), 2004, National League of Nursing (NLN) study, 2003, in the Journal of the American Medical Association (JAMA)
[3] http://www.mchc.org/public/FutureCare/Full%20report.pdf; http://www.massnursing.org/MACN_July05.pdf
[4] See also experience in North Carolina Report
[5] http://www.rishape.org/study/docs/Help_Wanted.pdf; North Carolina
[6] http://www.center4nursing.org/workforce/supplydemandaug2005.htm
[7] http://www.aft.org/pubs-reports/healthcare/Empty-Hallways.pdf
[8] [North Carolina - State of Allied Health Report, August 2004 http://www.shepscenter.unc.edu/hp/resptherapy04.pdf]

according to Census trends between 1995 and 2000 (latest data available), might still be a problem for registered nurses although wages in neighboring states (Ohio, Kentucky, Illinois, Michigan) seem to suggest that respiratory therapists would have a higher incentive to migrate.

Root Cause 1 Lack of Training Capacity

Most applicable to: Registered Nurses, Licensed Nurses, and Respiratory Therapists

Interviewees in EGR 8 noted a general lack of training options as a primary cause for shortages. This lack of training options is often linked to capacity shortfalls created by a lack of qualified instructors, a problem well known in other regions and states as well. Readily available training program information indicates that, except for nursing aides, all other critical health care occupations are at or near their training capacity or there are not enough programs available in EGR 8.

> *"There is a lot of interest in nursing careers specifically, but a lack of space for teaching and faculty to teach are a major problem"*

According to the interviewees, a problem with healthcare training seems to be structural issues and bottlenecks to developing and attracting qualified instructors at our local training providers. The major problems associated with training capacity can be broken down into the following areas:

1. Accreditation Standards Barriers: It is difficult to maintain the required number of qualified faculty to teach in accredited nursing or other related health care programs. National/State accrediting bodies require higher standards for qualified instructors in nursing and other related disciplines, and the rules and regulations of the State Nursing Board and the National Accrediting Body require master's level degrees for instructors in nursing programs (2-year). Because the bar is set higher for educational attainment, it is difficult to get people into teaching. Another important point of view brought out in the employer interviews was that 2 and 4-year educational institutions are pushing students to pursue Masters and/or Ph.D. tracks to do research rather than enticing them into teaching or serving in industry.

It should also be noted that two of our interviewees have served as trustees of higher education institutions in our region or in adjacent regions, and both commented that the Indiana General Assembly must act to allow external compensation programs that could attract students into teaching careers in health care programs. For example, one suggestion was to forgive tuition costs for students getting nursing degrees that go into teaching and stay as instructors in the region for a period of 5 years. This issue, however, must also be addressed within Ivy Tech and the Higher Education Commission and may require a look at legislation that allows this practice.

2. Wage Rates for Qualified Instructors: Faculty at the colleges and universities can make much more by working in the industry than teaching, which leads to less qualified candidates pursuing teaching as a career option. Fewer faculty available to teach limits the number of courses and slots for students that exist in accredited training programs in EGR 8. This is a particularly important issue and is the foundation of our bottleneck.

   The pay issue is dictated in part by training providers' administrative bodies. For example, several local employers cited that Ivy Tech Bloomington has a substantial bottleneck due to lack of competitive wages for instructors. Nursing faculty in the area can make upwards of $25,000 per year more by working in the private sector than by teaching. Local employers have indicated a willingness to provide stipends or other financial support to faculty at Ivy Tech. Ivy Tech, however, has internal barriers to increasing pay rates across faculty departments that will not allow nursing faculty to receive more pay than faculty in other departments. This amounts to an issue that Ivy Tech Administration and/or the Indiana General Assembly must solve, and is not one that local employers can address. Similar issues abound for Indiana University, as well as for other regional training programs (i.e. Indiana State University, etc.).

3. Clinical Experience: One critical element for any of the health care programs is that students are required to seek clinical site experience as part of the course requirements. It is clear from the interviews that employers collectively need to do a better job of managing the students on site in a consistent manner. This was

prevalent across all the employers interviewed for our report. All realized that more efficient clinical models must be developed between training providers and employers to manage the on-site student experience. Improved schedule management, communication on how to more effectively serve students, and ensuring consistent availability of slots are key concerns.

Another critical point is that standards require population density for some more specialized degree tracks (i.e.-psychiatric nurses), and there must be diverse locations for clinical experience. In some cases there are only a few providers with these specializations, which often limits the number of slots available for experiential learning.

4. Costs to Operate Programs: The State Board has vast clinical instruction requirements which make programs expensive to operate given the equipment/labs etc. that are needed. This cost of operating programs to standard makes it difficult for training institutions. The evolving nature of the necessary equipment, as well as the cost of labs for instruction can be a major barrier. Equipment that has been donated has been used to combat the cost issue, but many times this has been difficult to coordinate internally. Partnerships with industry can offset costs through donations to support core programs, and recently efforts to develop these types of collaborations have been increasing. Particularly at the 2-year institutions, employers need to become much more engaged in donating equipment or providing direct financial assistance to support core programs that, in turn, can bring qualified employees to them.

All of these issues result in a supply shortage for adequate training programs for health care personnel. Respondents also feel that two and four year institutions have to do a better job in retaining qualified instructors. Increased compensation and benefits are clearly a need and the ability to further enhance programs with better support, equipment and facilities must be improved.

Registered Nurses

According to the Bureau of Labor Statistics, registered nurses and respiratory therapists are, on average, required to have an associate's degree. However, depending on the nature of the employee, preferred education requirements might differ substantially. For example, the Indiana ERISS survey reports that for registered nurses, the preferred education requirements in Indiana are above the national average requirement. This probably reflects Central Indiana's need for very specialized care professionals that might not apply to a less urban area such as EGR 8. This does imply, however, that the region should have a variety of training options available.

There are an estimated 40 training providers for registered nurses in the state of Indiana including one online training option. Twenty-five of these programs provide a bachelor's degree, fourteen programs provide an associate's degree, and one school of nursing provides a diploma. The training capacity on average has been reached in the most recent year with many institutions maintaining a waiting list, especially for the bachelor's programs. The majority (64 %) of enrolled students were estimated to have completed that program and taken a job somewhere in Indiana with almost all (98 %) placed in the health care sector. This share of students completing and staying in the health care sector in Indiana is slightly higher for graduates of the associate's programs than for the graduates from the bachelor's programs.[9] It can be noted that one cause for this leakage is the wide variety of career options available outside of traditional health care at medical device companies, companies that perform clinical trials, and insurance companies utilizing nurses to perform blood tests, just to name a few.

In EGR 8 the training capacity also seems to be insufficient, as Ivy Tech has a waiting list. In the region there are one bachelor's and two associate's degree programs available with Ivy Tech showing high completion rates (over 90%) and a high placement rate in Indiana, (95 % placed in Indiana's healthcare industries). There definitely seems to be a need to expand training capacity especially for the more advanced degree level if employers in EGR8 reflect statewide demand. In-state tuition costs per year (usually 30 credits) in EGR 8 are around $3,700 for the associate’s programs and close to $6,000 for the bachelor's program. A number of Ivy Tech programs (associate's degree) in the rest

[9] Note that the first report only used the combination of completion and placement rates, e.g. the share of people graduating as well as staying in the EGR 8. For a more causal analysis we have split up these two factors in our interviews with training providers.

of the state have lower tuition costs. The bachelor's program at Indiana University – Bloomington provides an average tuition cost (close to other state school programs in the state), compared to many private university programs throughout the state that sometimes charge over $20,000 in tuition.

Licensed Practical and Vocational Nurses

Licensed practical nurses in general are similarly required to have 2 to 3 years of postsecondary training. There are 17 training institutions in Indiana that provide certificates in nursing in order to become an LPN, 14 of which are Ivy Tech programs. Training capacities were not fully reached in 2004, the average completion rate was fairly high (88 percent, though with high variance) and with almost every student being placed in Indiana in the health care sector. EGR 8 primarily utilizes two of those providers with Ivy Tech being close to capacity and with high completion and Indiana placement rates (90% and 99% respectively). Ivy Tech also has a waiting list. Vincennes University enrolls a smaller number of LPN students.

Respiratory Therapists

Although Ivy Tech Bloomington plans a Respiratory Care program for 2006, there are no current training programs for respiratory therapists in EGR 8. There are only seven programs in the state with IUPUI having the only bachelor's offering in the Central Indiana region. However, the programs have an over 80 percent completion rate and almost all students tend to be placed in Indiana's health care industry. The programs are all estimated to have some small room left in their training capacity. There is a clear lack of any local training options for EGR 8 and given the strong demand in the rest of the state it will be a challenge to attract those students to the region (also see section on wages).

Nursing Aides, Orderlies, Attendants

Nursing aides are a bit different in that employers in Indiana actually did not require any experience according to the ERISS survey, while the U.S. Department of Labor's anticipated training and experience requirements for this occupation is a high school diploma plus work experience (short-term on-the-job training of less than 1 month). Generally, nursing aides do not require an official training program, usually only a high

school diploma. A training root cause is therefore less applicable to this occupation. CNAs are required, however, to pass a state licensing exam.

Indiana does provide some training opportunities for certified nursing assistants with several Ivy Tech programs and a program at Clarian Health Partners. Clarian is at its training capacity of 75 students and has a 97 percent completion rate as well as a close to 100 percent placement rate in Indiana's health care sector. A number of employers also offer training programs for individuals who wish to enter this occupation.

Sensitivity

Changes in the conditions for educators would be a necessary step to attract more teachers and expand the training capacity in the region. Based on the predicted gap of 350 registered nurses over the next seven years, training providers in the next two to three years would basically have to triple enrollment numbers in order to accommodate the demand in the region just through new graduates. This is without considering migration patterns.

Attracting graduates from other areas of the state is therefore crucial as well. Like most small metro / rural regions, Region 8 lacks the size of demand to justify scale of operations for many specialty fields in health care. But, unlike many such regions, Region 8 could position itself as a center for learning and discovery, which is already reflected in its emphasis on the life sciences and economic development. Consequently, a more proactive set of strategies, looking beyond the training needs of the region per se might make sense and deserve exploration in the solutions stage.

In the case of licensed practical nurses in EGR 8 the production of new graduates would not have to increase quite as dramatically for the time being. An increase by 20 percent over the next three years, followed by a healthy general growth rate of several percent, should be able to balance the labor market. Equally, training of respiratory therapists has enough room to expand and does not have to meet very high local numerical demand. Ten to fifteen students over the next year would be sufficient to match the regional gap, provided that those students would accept jobs within EGR 8.

Root Cause 2 Wages and Benefits

Most applicable to: Registered Nurses, Licensed Nurses, Nursing Aides

Existing studies have pointed to non-competitive wages and benefits for respiratory therapists and nursing aides. Although interviewees in EGR 8 pointed to non-competitive wage levels in the region as an issue, most of their focus was on low wages for instructors, contributing to the lack of qualified candidates.

> *"Better pay keeps them, but cultural issues within the hospital will overshadow that to a point."*

As mentioned in the previous section, there are many barriers to improving compensation for qualified instructors. An internal administrative barrier limiting the pay rates of instructors is most prevalent, since industry has expressed a willingness to help with stipends or other benefits to attract and retain employees. Several local employers also noted that non-competitive wages combined with quality of life are making it difficult to find local doctors in most parts of the region and are contributing to a higher than average turnover in nursing staff. Several interviewees noted that it's not just wages, claiming that quality work life is an important factor (i.e. - internal work culture, work schedules), especially in retaining workers.

Given the nature of the delivery of health care, physicians' practices have better hours (9AM to 5PM) for employees than do hospitals that operate 24 hours a day, 7 days a week. Therefore, it is more difficult for hospitals to attract and retain qualified nurses, and LPNs. Many respondents cited that it is important to take into consideration the internal culture of the institution in which the health care employee works. For example, nurses are being asked to do increasingly more work in hospitals but are often treated as "second-class citizens" by physicians in the fast-paced hospital environments. Employers see this issue and try to work on it, but it does drive many nurses into less stressful environments such as physician practices or other career tracks. Stress was another consistent factor that affected attraction/retention, as many nurses have gone to working primarily for temporary agencies to better control their schedules and work in environments where they feel more comfortable.

Comparative data at the industry level, however, suggests that for the critical occupations wages can pose a competitive problem, at least in hospitals (the majority of respiratory

therapists are employed in hospitals) and nursing facilities where most of the nursing aides are employed.

Average Annual Industry Wages, 2004							
Industry (NAICS)	**Region 8**	**Indiana**	**Indiana = 100**	**US = 100**	**Avg. Annual Growth 1994-2004**		
					Region 8	**Indiana**	**U.S.**
Ambulatory Health Care Services (621)	$42,600	$46,217	92	92	5.1%	3.4%	3.2%
Hospitals (622)	$35,316	$37,222	95	83	5.3%	4.7%	4.8%
Nursing and Residential Care Facilities (623)	$20,999	*$22,644*	93	88	5.5%	5.3%	4.6%

Source: IBRC; BLS, QCEW

At the occupational level, the region has very different experiences. Respiratory therapists may not be getting attracted away due to higher wages in other regions as the EGR 8 hourly wages are well above the Indiana and U.S. averages. For registered nurses, employers are mainly competing with other states rather than the rest of Indiana. For example, compared to the EGR 8 hourly wage of $22.3, registered nurses in Ohio, Illinois, Michigan and Kentucky, earn between $22.5 and $25.3 and a national average of $25.4 per hour. Licensed practical nurses and nursing aides seem to be slightly underpaid in EGR 8 compared to the rest of Indiana (1-2 percent lower than the Indiana average) and three to six percent lower than the U.S. average, respectively.

Average Hourly Wages, 2003					
Occupation	**Region 8**	**Indiana**	**Indiana = 100**	**Midwest* = 100**	**U.S. = 100**
Registered Nurses	$22.3	$22.2	100	94	88
Licensed Practical and Licensed Vocational Nurses	$15.8	$16.0	99	98	97
Nursing Aides, Orderlies, and Attendants	$9.7	$9.9	98	96	94
Respiratory Therapists	$21.3	$19.6	109	110	103

*Note: * Average of Ohio, Illinois, Michigan and Kentucky*
Source: IBRC; BLS, OES, November, 2003

Nursing instructors in the state received an average annual wage of $52,720 in 2004, which is actually substantially above the average for all occupations of $33,820 (Bureau of Labor Statistics, Occupational Employment Survey, November 2003). This was above Illinois and Ohio, but below Michigan and Kentucky. However, there is no local data available to confirm this experience for the EGR 8. Projected new jobs for Health Specialties Teachers, post-secondary by DWD for the region for 2002 – 2012 are 20. Replacements are estimated at 20 for the same period, so no new growth is expected for this occupation.

Sensitivity

An article in Health Affairs in 2003 estimated that inflation-adjusted wages would have to increase close to four percent per year between 2002 and 2016 to end the national nurses shortage.[10] Given that the wages in EGR 8 for registered nurses are more then 10 percent below the national average, wage increases would have to be even more substantial, probably closer to 5 percent annually in order to close the regional gap. This becomes all the more sensitive, as alternative employment for nurses becomes attractive. Licensed practical nurses and nursing assistants to a lesser extent might be enticed to stay in or come to the region with a slight annual wage increase. But health care employers' ability to pay more is constrained by reimbursement caps. Consequently, non-remunerative benefits will likely become more important. Some interviewees pointed out that wages can be moderated by workplace culture. Equally, community quality of life could play a key role in making Region 8 more attractive.

> *"We will compete on wages, but nurses are now finding jobs outside of hospitals and clinics in other areas."*

Root Cause 3 Career Awareness, Pipeline Issues and School Preparation

Most applicable to: Registered Nurses, Licensed Nurses, Nursing Aides, and Respiratory Therapists

With respect to pipeline issues, many interviewees pointed to the fact that there is a fair amount of interest for pursuing work in the field, but limitations in the training programs

[10] Spetz, Joanne and Ruth Given. 2003. "The Future of the Nurse Shortage: Will Wage Increases Close the Gap? Health Affairs, 22 (5): 199-206.

are keeping many out of the field (covered under Root Cause 1). Some of this can be attributed to lack of open slots at Ivy Tech in nursing, for instance, where students wanting to apply may be forced to be on a waiting list for two semesters. Students don't want to wait around that long, and thus seek alternate career choices or reject education altogether.

> *"Many times students are able to identify the health care profession as their career area, but they do not know the education and skill requirements that are necessary to work in their selected field."*

Career awareness, beyond the structural issue of available training slots covered in the Root Cause 1 section, is key. It is not uncommon to have students pursue careers in health care initially because of the pay and importance, but once engaged in the program, "don't like to see blood!" Many of these students then change career paths into something else completely or in other environments. Better information about what health care workers actually do and see in the external health care world will offset turnover in career development. Employers' efforts to better coordinate clinical site experience in their facilities will help, as well as efforts to provide more venues for students to hear from actual practitioners about their daily responsibilities. It will be important in the Solutions Phase to gather input from training providers, students, teachers and employers about how to attack this problem.

> *"Not enough emphasis on seeding the path in K-12."*

Other more direct pipeline issues in EGR 8 are rooted in a lack of basic skills and job matching taking place in the public education system. Although respondents see interest in the critical health care occupations, many of the potential candidates lack basic skills and are not aware how to seek training. Better attention would need to be paid at the K-12 level towards matching interest in the field with the correct path of training to create eligible candidates.

The public schools 2005/2006 ISTEP results for Grade 10 for mathematics and English skills, however, show no disproportionate problem with the average high school graduate's skills at least at a technical level. The average percent of students in EGR 8 (based on school corporations in the region) passing the mathematics and English test in Grade 10 is 59 percent, compared to an Indiana average of 56 percent. The performance has not changed significantly in the region over the last six years. However, results vary

anywhere from 17 percent to 85 percent in 2005/06. Different employers might therefore face a much differentiated high school graduate cohort. Daviess County has shown the best test performance above the Indiana average, largely due to the Barr Reeve High School with over 80 percent passing rate. Monroe County also has several well performing high schools.

In addition to gaining an increased awareness about available career opportunities, students also need more information about the required skills sets and expectation of employers in the health care industry. ONET skills such as active learning, active listening, critical thinking, monitoring, speaking, writing, reading comprehension, and mathematics certainly cut across all four occupations targeted by this report. These skills are the foundation upon which successful movement up the health care career ladder is based. Public schools, guidance counselors, and the workforce development system need to make a conscious effort to ensure that students who express an interest in health care careers are aware of the full set of skills and abilities that are required. Further, schools and workforce development professionals also need to emphasize the importance of work ethic, positive attitude, dependability and other job retention skills.

Sensitivity

The test results of high school students in EGR 8 suggests that, on average, students with good basic skills are available but that the distribution varies substantially. Target programs at those school corporations that under-perform could help employers in those regions. Expanded career awareness was called for by several interviewees, but for today's young prospect this requires not only information, but also choices outside of direct health care. There might also be an overall need to advance other basic skills such as communication or work ethic that will increase the employability of high school students in the region. Better coordination between K-12 providers, higher education providers and health care employers will need to be developed to address these issues. The Bloomington Life Sciences Partnership Human Capital Committee has the potential to address this issue, but it must be done with participation from a larger segment of EGR 8.

Conclusion

INCIDENCE OF MAIN ROOT CAUSES			
Critical Occupations	**Career Awareness, Pipeline Opps, School Preparation**	**Training Capacity**	**Wages**
RNs	X	X	X
Licensed Practical Nurses	X	X	X
Nurses Aides	X		X
Respiratory Therapist	X	X	
Big Issues: Much outside local control, e.g. healthcare reimbursement policies / regulations affecting wages, local training capacity (faculty, facilities); job stress / turnover, attractiveness of jobs outside direct care; all regions / states in same boat; quality of work life is important to these professionals.			

1. **How does the demand side contribute (Compensation levels, work environment, etc.)?**

   Compensation plays a big part, not so much region to region, but compared to other occupations with less stress and scheduling difficulties. Nursing remains a profession for the dedicated in Region 8 as elsewhere. Most noticeably, at the margins, qualified nurses are hiring into jobs outside of traditional care, adding to availability problems.

2. **How does the supply side contribute (training capacity, responsiveness of training offerings, and coherence of "supply chain" of workers)?**

   By far the most troubling root cause is training capacity, while common in similar studies, capacity problems were quite prominent in EGR 8.

3. **How do demographic / geographic factors contribute (sustained workforce size, age distribution, mobility)?**

   No major discernable demographics arose in this investigation.

4. **How much do each of these factors contribute (identify contribution of each factor to shortages)?**

   This inquiry indicates the following order of importance with Rank # 1 being the highest:

   1. Training Capacity
   2. Wages and Benefits
   3. Career Awareness, Pipeline Issues and School Preparation

   Root causes of skill shortages in high demand health occupations are many. While the top 3 have been identified, several others are closely related and deserve inclusion in the solutions phase. This analysis highlights two critical occupations that are particularly in crisis and can be associated with very specific principal root causes that lend themselves for policy actions. Registered and Licensed Practical Nurses in EGR 8, as everywhere in the nation, are in a shortage situation. This is expected to worsen over the next years. The lack of training capacity in EGR 8 will require substantial initiatives to increase faculty, as well as an effort to attract recent graduates from outside the region. Expanding training capacity will not solve the problem quickly, especially for registered nurses. Wages and benefits need to be adjusted in order to compete more effectively with other regions or states and the attractiveness of the area could be marketed more effectively.

IV. CONCLUSION

A. Description of Each Root Cause

Interestingly, a common set of root causes applies to all four industries. These can be summarized as: Career Awareness, Pipeline Issues, Training Capacity, Leakage/Mobility, and Wages and Benefits. Each root cause plays out a little differently in each industry, but a brief description is as follows:

Career Awareness

The K-12 and labor market information system appear to be lacking in real time, useful information about careers and career pathways. Most significantly, career awareness and counseling in schools appears to be inadequate, but resources available to adults also need improvement.

With the fast-paced economy in which occupations are changing, significantly up-to-date and readily accessible information is going to be important for a prosperous region. A strategy for utilizing this information to increase awareness about the available career paths within these key industries will also be vital.

Efforts must also be made to ensure that students are aware of the skills required to be successful within each industry. Skills such as mathematics, reading comprehension, speaking, writing, and critical thinking are needed in nearly every career path targeted by this report.

Further, increased focus must be placed upon ensuring that current and potential workers understand the importance of job retention skills such as work ethic, positive attitude, and dependability. Many employers who participated in interviews, particularly those from the manufacturing and hospitality sectors, reported difficulty finding workers who have the necessary basic skills and job retention skills to be successful on the job.

Pipelines

As careers become more varied and career pathways more complex, educational providers will have to find better ways for linking educational and training offerings into these pathways. This calls for a very different collaboration among providers and better linkages with area employers.

Capacity

Not surprisingly, in a small metro / rural region it is not possible to provide training capacity in all areas of specialization. But even so, several occupations with large employment identified in this project do not have in-region or near-region resources sufficient to fill training gaps. This applies particularly to the health care field.

Leakage and Mobility

One of the reasons the United States economy is so productive is the flexibility of its labor force. Human capital moves to where it is most in need and is enticed by wages and benefits. Mobility in and out of the region can be expected and should be embraced. If the region has productive and growing companies, it will be attractive to existing or outside workers. The mobility root cause is tied to deep root cause factors, such as quality of life, access to urban amenities, proximity to colleagues with similar interests etc. Some employers are recognizing that the root cause is not only influenced by wages and benefits but quality of work-life, work-life balance, and community quality of life.

Wages and Benefits

Wages and benefits in a free labor market are always a root cause for demand / supply imbalances. In the case of Region 8, like many smaller semi-rural regions, wage rates tend to be below state and national averages so there is an inherent disadvantage to begin with. The issue of wages also relates to the competition among various industries for labor within the region. A number of occupations have skills that are transferable among several industries, which can cause competition among those industries for the same pool of workers. For example, a better paying job for first line supervisors in an industry like construction can lure workers with similar skills away from the manufacturing industry.

B. Relative Importance to Addressing Skill Shortages

While other root causes were identified, they related primarily to one critical occupation. The five described above, scored highly in the interviews, whereas higher root causes were specific to critical occupations. One root cause, for example, that is very important to the electrical and electronic engineering technicians in Professional, Scientific and Technical services, is the aging of the workforce, not just the technician workforce but also the aging engineering workforce. This inquiry validated the five key root causes above, by referring to external research, either national or state specific. Much of this confirmed the importance to addressing the specific skill shortages. For example, training capacity is regarded nationally as a significant root cause, affecting shortages in the health care fields, particularly nursing.

C. Evidence Given as to How the Root Cause was Identified

This inquiry shows equal balance of evidence between interviews of firms covering all counties, statistical evidence regarding wages, growth, training providers, etc., and scholarly work relevant to the issue of skill shortages and their root causes. Where there was doubt regarding prioritization, preference was given to the field interviews.

D. Ranking of each Root Cause

Local employers were asked to provide input on the priority ranking of the root causes that were identified for the shortages. The table below indicates the priority ranking for root causes within each of the key industries:

Industry	Ranking (1 being most important)
Manufacturing	1. Pipeline Issues / Career Awareness 2. Lack of Training 3. Non-Competitive wages and benefits.
Professional, Scientific and Technical Services	1. Career Awareness 2. Training Options 3. Leakage.
Hospitality	1. Pipeline Issues and Career Awareness / Image 2. Recruitment and Retention 3. Wages and Benefits
Health Care	1. Training Capacity 2. Wages and Benefits 3. Carer Awareness, Pipeline Issues and School Preparation.

E. Sensitivity of the Projected Future Shortages to Changes in the Root Cause

1. Career Awareness, Pipeline and Training Capacity

If career awareness is not improved substantially, several of the occupations identified as critical could become less critical and could go away altogether. For example, if improvements cannot be made in career awareness and in career preparation for team assemblers and first-line supervisors, the trend of moving production off-shore will be exacerbated. Given that health care demand is increasing with an aging population, if career awareness and training capacity do not improve, the level of health of the population will decline and from an economic development point of view, workers will be less productive.

2. Leakage and Mobility

If Region 8 remains unknown, or perceived to be unattractive, to a mobile workforce, it will continue to be left with finding workers, under-prepared for their tasks and occupations. From an economic development point of view, this has significant consequences for productivity and higher productivity means higher wages and a higher local standard of living.

3. Wages and Benefits

This is a root cause largely outside the control of the project, but if wages and benefits were to decline relative to competitor regions, again, the region will be left with sub-standard workers, who contribute less to overall productivity and output.

The region is facing growth opportunities in all four industries identified in the SSI project. In the case of healthcare and hospitality, the numeric growth is quite notable. In the case of PS&T, the growth prospects are not only numeric, but in higher pay, professional and paraprofessional employment, and in the case of Manufacturing, the growth will be less so in employment and more in output and productivity. The region cannot afford to allow these root causes to deteriorate any further, if it does, it will be unable to take advantage of its unique opportunities for growth in the next 10 – 20 years.

F. Quantitative Estimation of the Reduction of Future Shortages

Until solutions are crafted in the next phase of the project, it is not possible to estimate quantitative reductions in future shortages. However, it is possible to highlight the direction of impact for solutions that may be relatively low cost. For example, redesigning career awareness activities in a coordinated fashion, may not require a lot of additional resources, but could significantly overcome the current severity of the root cause. If educational providers could coordinate creatively to provide seamless learning from senior high school through post-secondary, into life-long learning, much higher levels of productivity could be accomplished without a lot of major educational restructuring or new dollars.

G. Regional Consortium and Industry Partner Participation

A team of individuals from Corcoran & Wishart, LLC; Vincennes University; Department of Workforce Development local offices; Bloomington Economic Development Corporation; and Thomas P. Miller and Associates participated in the development of this report. By using the SSI Research and Identification Guidebook and the available web-based workshops, every effort was made to

utilize the recommended methodology to the fullest extent in reaching the identified root causes contained in this report.

The Region 8 Consortium is comprised of key economic development representatives, employer representatives for key industries, business association members, educational representatives and others. The Consortium advises the SSI agent and staff in the development of the three reports and will play a key role in determining and prioritizing the solutions for which funding will be requested. An Executive Team is established to meet more frequently to review progress. The Consortium has endorsed this Root Cause Report. Executive Team members representing private employers, economic development, higher education, workforce development, and labor have demonstrated their support by signing the cover sheet of this report.

H. Regional Context

Every effort has been made in this project to take a regional perspective; this is a relatively new region from the point of view of creative problem solving for economic development and workforce development. This provides opportunities to build new partnerships and bridges which have been apparent from the interviews. A number of business owners / leaders are anxious to solve root causes at a regional level.

I. Potential Savings from an Aggressive Effort to Reduce the Impact of Root Causes

As a result of the identification of these root causes, an attempt has been made to calculate an early estimation of the impact of skill shortages and the potential savings if actions are taken to address the root causes. Until solutions are developed and agreed upon in the Solutions Report, specific impacts and savings cannot be estimated. The estimation below is an early exploration based on the premise that all solutions will ultimately affect hiring costs positively -- including reducing the need to hire due lower turnover/higher retention of more motivated workers; preparing candidates better, avoiding wasted time filtering out unqualified candidates; and getting better job and labor market information to job

seekers with feedback to employers. The methodology of this early estimation is as follows:

1. Assume certain costs for hiring a worker at three occupational levels:
   - Hourly occupations: $2,000 per employee
   - Mid-level occupations: $10,000 – 15,000 / employee
   - Professional / technical occupations: $20,000 – 25,000 /employee

   These estimates were arrived at from discussions with several local employers and are congruent "rule of thumb" figures used by human resource professionals. They include direct search costs, loss of productivity while the position is vacant and immediate costs of orientation.

2. The figures above deal with direct costs of bringing a new person on board, but don't include the indirect costs associated with productivity loss over 6-12 months, as the new person gets up to speed, possibly making more mistakes than an experienced worker and requiring integration into work teams. National estimates vary as to what this indirect multiplier might be, but can be in the order of ½ the salary of the worker in the first year. Here it is assumed to be the same as the hiring costs again, so the total costs, direct and indirect are double those shown above.

3. The estimated openings per year from the first report are multiplied by the direct and indirect costs of adding or rehiring. It is then assumed that an aggressive effort to reduce the impact of the root causes, particularly root causes of career awareness, pipeline, and capacity, will reduce the overall cost of hiring by 50%.

4. The Table below shows the tabulations for each critical occupation.

	Average Openings / Yr	**Est. Cost /worker of hiring & loss of productivity**	**Total Costs, Direct and Indirect (,000)**	**Potential Savings (,000)**
First Line Supervisors	21	20,000	420	210
Team Assemblers	92	4,000	368	184
RNs	95	40,000	3,800	1900
LPNs	31	30,000	930	465
Nurses Aides	57	4,000	228	114
Respiratory Therapists	13	50,000	650	325
Electrical & Electronic Engineering Technicians	23	30,000	690	345
Combined Food Prep & Serving Workers*	131	4,000	524	262
Food Prep Workers*	37	4,000	148	74
Waiters & Waitresses*	108	4,000	432	216
Receptionists & Information Clerks*	33	20,000	660	330
First-Line Supervisors of Food Prep and Serving Workers*	20	40,000	800	400

* Although these occupations have not been defined as critical occupations within the hospitality industry in EGR 8, they are occupations that have been mentioned frequently by employers as the occupations where the largest numbers of workers are needed. As such they were used to calculate an estimate of savings within the hospitality industry. There are numerous other occupations within that industry that could also benefit from the solutions to these root causes, which would result in even more savings to the region's hospitality employers.

The total potential savings are $ 4.825 million. This would suggest that additional expenditures on solutions up to approximately $5 million/year would lead to a net gain to employers, so long as hiring and related productivity costs can be reduced by 50%. Note that this estimation does not include other benefits more difficult to measure, such as direct gains to workers and spillovers on other firms who do business with these particular industries where worker hiring and productivity has been improved.

APPENDIX 1

INTERVIEW METHODOLOGY

Although secondary data sources and ERISS survey data was useful in an assessment of some root causes, to validate those findings and get a better pulse of issues within the region, qualitative interviews were conducted with select organizations and firms throughout the region. A sampling of firms was selected to be contacted. The sample was selected based upon location within the region as well as having a primary NAICS code within one of the four sectors that are a focus of this study. Although not all contacted organizations participated, 48 firms did participate. The overall participation rate was approximately 70 percent.

Professional, Scientific & Technical
Participants = 12
Counties Covered = Daviess, Greene, Lawrence, Martin, Monroe, Orange

Manufacturing
Participants = 11
Counties Covered = Daviess, Greene, Martin, Monroe, Orange, Owen

Hospitality
Participants = 17
Counties Covered = Brown, Daviess, Greene, Lawrence, Martin, Monroe, Orange, Owen

Healthcare
Participants = 8
Counties Covered = Brown, Daviess, Lawrence, Monroe, Orange, Owen

An interview team of eight individuals were involved in the interview process. The interviewers were trained on interview technique and were given a standard set of questions to be covered within the interview.

Interview Team:
Shane Burkhardt, AICP – American Consulting - Interview Coordinator
Steve Bryant – Bloomington Life Sciences Partnership – Interviewer
Ron Arnold – Daviess County Economic Development Corp. – Interviewer
Mike Gentile – Southern Indiana Business Alliance – Interviewer
Judy Gray – Orange County Economic Development Partnership – Interviewer
Scott Hutcheson – Purdue University Office of Engagement – Interviewer
Joe Pearson – Purdue University Office of Engagement – Interviewer
Don Anderson – Purdue University Travel and Hospitality Research Center - Interviewer

Interviews were conducted during the period of November 9th through December 2nd, 2005. Most interviews were conducted in person, although due to time constraints and availability of the respondent, some interviews were conducted over the telephone. Although the interviews were conducted in a free-flow conversation style, all standard

questions were required to be covered at some point during the interview. The interview questions focused on:

- Standard information about the organization or firm
- Validation of critical occupations from Phase I
- Identification of root causes of skill shortages
- Prioritization of root causes of skill shortages

Although the interviews were qualitative in nature, quantitative information was gathered on the overall root causes. Root causes identified during the interviews were classified into standard categories and tallied. This produced a prioritized root cause list that could be checked against root causes identified from secondary data sources and ERISS surveys. Qualitative information from the surveys was also used to provide regional views on the top root causes for skill shortages as well as provide more depth to the root cause findings.

Note1. While interviewees were asked to comment on root causes specific to each critical occupation, they were generally more comfortable in offering root causes for a broader class of occupations.

Note 2. While interviewees were asked to pick the top 3 root causes, many preferred to speak to 5 -6 root causes more broadly. Consequently the results for the "top three" should be treated with caution. Heavier weight should be placed on overall prioritization results.

APPENDIX 2

Root Cause Prioritization

These tables summarize the prioritizations from the aggregation of the interview results:

HEALTH CARE	N=8	Percent of Respondents
Lack of Training Options	5	62.5%
Non-competitive wages/benefits	3	37.5%
Lack of Qualified Instructors	3	37.5%
Lack of Career Awareness	2	25.0%
Lack of Training Strategy	2	25.0%
Aging workforce	2	25.0%
Lack of Suitable Classroom Space	2	25.0%
Lack of Career Path	1	12.5%
Out-migration	1	12.5%
Stress conditions on the job	1	12.5%
Lack of Space in Training Options	1	12.5%
Cultural Issues in Workplace	1	12.5%
Lack of Accelerated Training		0.0%
Lack of Adequate Transportation		0.0%
Lack of on-the-job support		0.0%
High drop-out rate from training		0.0%
Inadequate Recruitment		0.0%
Inadequate Job Matching		0.0%

Generalized Findings

Lack of training Options

Lack of Career Awareness

Non-competitive wages / benefits

Lack of Qualified Instructors

MANUFACTURING	N=10	Percent of Respondents
Lack of Career Path	8	80.0%
Lack of Career Awareness	6	60.0%
Lack of Training Strategy	4	40.0%
Lack of Training Options	4	40.0%
Aging workforce	4	40.0%
Out-migration	3	30.0%
Quality of Life	3	30.0%
Work ethic	3	30.0%
Lack of Adequate Transportation	2	20.0%
High drop-out rate from training	2	20.0%
Non-competitive wages/benefits	2	20.0%
Competition with welfare benefits	2	20.0%
Lack of Accelerated Training	1	10.0%
Lack of on-the-job support	1	10.0%
Inadequate Recruitment	1	10.0%
Inadequate Job Matching	1	10.0%
Stress conditions on the job	1	10.0%
Basic Skills	1	10.0%
Local culture	1	10.0%
Location	1	10.0%
Lack of Space in Training Options		0.0%
Lack of Qualified Instructors		0.0%
Lack of Suitable Classroom Space		0.0%
Cultural Issues in Workplace		0.0%
Childcare		0.0%

Generalized Findings

Lack of Career Awareness

Lack of Career Path

Lack of Training Strategy

Lack of Training Options

High drop-out rate from training

Aging workforce

Non-competitive wages / benefits

Quality of Life

Work Ethic

PROFESSIONAL/TECHNICAL/SCIENTIFIC	N=12	Percent of Respondents
Out-migration	7	58.3%
Lack of Career Awareness	5	41.7%
Aging workforce	5	41.7%
Lack of Career Path	3	25.0%
Lack of Accelerated Training	3	25.0%
Lack of Training Options	3	25.0%
Lack of Training Strategy	2	16.7%
Inadequate Recruitment	2	16.7%
Non-competitive wages/benefits	2	16.7%
Quality of Life	2	16.7%
Location	2	16.7%
Lack of Adequate Transportation	1	8.3%
Lack of on-the-job support	1	8.3%
High drop-out rate from training	1	8.3%
Inadequate Job Matching+A31	1	8.3%
Stress conditions on the job	1	8.3%
Basic Skills	1	8.3%
Security Clearance	1	8.3%
Lack of Space in Training Options		0.0%
Lack of Qualified Instructors		0.0%
Lack of Suitable Classroom Space		0.0%
Cultural Issues in Workplace		0.0%
Childcare		0.0%
Work ethic		0.0%
Competition with welfare benefits		0.0%
Local culture		0.0%

Generalized Findings

Out migration

Aging workforce

Lack of Training Options

Lack of Career Awareness

HOSPITALITY	N=17	Percent of Respondents
Lack of Career Awareness	12	75.0%
Lack of Career Path	12	75.0%
Lack of Adequate Transportation	11	68.8%
Lack of Training Strategy	10	62.5%
Non-competitive wages/benefits	8	50.0%
Childcare	8	50.0%
Lack of Training Options	7	43.8%
Basic Skills	6	37.5%
Out-migration	5	31.3%
Inadequate Job Matching	5	31.3%
Work ethic	5	31.3%
High drop-out rate from training	4	25.0%
Stress conditions on the job	4	25.0%
Lack of on-the-job support	3	18.8%
Inadequate Recruitment	2	12.5%
Aging workforce	2	12.5%
Lack of Accelerated Training	1	6.3%
Quality of Life	1	6.3%
Lack of Space in Training Options		0.0%
Lack of Qualified Instructors		0.0%
Lack of Suitable Classroom Space		0.0%
Cultural Issues in Workplace		0.0%

Generalized Findings

Lack of Career Awareness

Non-competitive wages / benefits

Childcare

2.1 "Top Three" Root Cause Prioritization

HEALTH CARE	N=8	Percent of Respondents
Non-competitive wages/benefits	4	50.0%
Lack of Training Options	3	37.5%
Lack of Career Awareness	2	25.0%
Lack of Qualified Instructors	2	25.0%
Stress conditions on the job	2	25.0%
Inadequate Job Matching	1	12.5%
Lack of Suitable Classroom Space	1	12.5%
Out-migration	1	12.5%
Aging workforce		0.0%
Cultural Issues in Workplace		0.0%
High drop-out rate from training		0.0%
Inadequate Recruitment		0.0%
Lack of Accelerated Training		0.0%
Lack of Adequate Transportation		0.0%
Lack of Career Path		0.0%
Lack of on-the-job support		0.0%
Lack of Space in Training Options		0.0%
Lack of Training Strategy		0.0%

MANUFACTURING	N=10	Percent of Respondents
Lack of Career Awareness	4	40.0%
Basic Skills	3	30.0%
Competition with welfare benefits	2	20.0%
Lack of Career Path	2	20.0%
Lack of Training Options	2	20.0%
Lack of Training Strategy	2	20.0%
Aging workforce	1	10.0%
High drop-out rate from training	1	10.0%
Inadequate Job Matching	1	10.0%
Non-competitive wages/benefits	1	10.0%
Quality of Life	1	10.0%
Work ethic	1	10.0%
Childcare		0.0%
Cultural Issues in Workplace		0.0%
Inadequate Recruitment		0.0%
Lack of Accelerated Training		0.0%
Lack of Adequate Transportation		0.0%
Lack of on-the-job support		0.0%
Lack of Qualified Instructors		0.0%
Lack of Space in Training Options		0.0%
Lack of Suitable Classroom Space		0.0%
Local culture		0.0%
Location		0.0%
Out-migration		0.0%
Stress conditions on the job		0.0%

PROFESSIONAL, SCIENTIFIC, TECHNICAL	N=12	Percent of Respondents
Out-migration	6	50.0%
Aging workforce	4	33.3%
Lack of Training Options	3	25.0%
Non-competitive wages/benefits	3	25.0%
Lack of Career Awareness	2	16.7%
Inadequate Recruitment	1	8.3%
Lack of Accelerated Training	1	8.3%
Lack of Career Path	1	8.3%
Location	1	8.3%
Security Clearance	1	8.3%
Basic Skills		0.0%
Childcare		0.0%
Competition with welfare benefits		0.0%
Cultural Issues in Workplace		0.0%
High drop-out rate from training		0.0%
Inadequate Job Matching		0.0%
Lack of Adequate Transportation		0.0%
Lack of on-the-job support		0.0%
Lack of Qualified Instructors		0.0%
Lack of Space in Training Options		0.0%
Lack of Suitable Classroom Space		0.0%
Lack of Training Strategy		0.0%
Local culture		0.0%
Quality of Life		0.0%
Stress conditions on the job		0.0%
Work ethic		0.0%

HOSPITALITY	N=17	Percent of Respondents
Basic Skills	9	56.3%
Non-competitive wages/benefits	7	43.8%
Work ethic	5	31.3%
Lack of Career Awareness	4	25.0%
Small Labor Pool	4	25.0%
Childcare	2	12.5%
Lack of Training Options	2	12.5%
Lack of Career Path	1	6.3%
Stress conditions on the job	1	6.3%
Aging workforce		0.0%
Competition with welfare benefits		0.0%
Cultural Issues in Workplace		0.0%
High drop-out rate from training		0.0%
Inadequate Job Matching		0.0%
Inadequate Recruitment		0.0%
Lack of Accelerated Training		0.0%
Lack of Adequate Transportation		0.0%
Lack of on-the-job support		0.0%
Lack of Qualified Instructors		0.0%
Lack of Space in Training Options		0.0%
Lack of Suitable Classroom Space		0.0%
Lack of Training Strategy		0.0%
Out-migration		0.0%
Quality of Life		0.0%